Office of Care Coordination
Orientation Packet
January 2004

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Introduction

This packet has been developed through a collaborative effort of OCC and field staff as a resource to standardize how Care Coordination and Home Telehealth services in VHA are designed and implemented to ensure they are safe, appropriate and beneficial to patients and their families as well as being convenient for clinicians. These resources are intended for use by VISN care coordination/home telehealth (CCHT) initiatives that have been awarded technology monies through the OCC RFP. However, other initiatives are welcome to use these to assist them in preparing an existing home telehealth program to meet the conditions for participation to become one of VHA's CCHT programs.

Welcome Letter

Section 1.	Needs Assessment for Care Coordination and Patient Selection Criteria

Needs Assessment

It is important to target patient populations that are appropriate for the successful deployment of CCHT services. Current literature supports a variety of diseases and conditions that can be successfully managed using CCHT. Conducting a needs assessment determines the appropriate patient populations to target and provides data on:

1. Local patient-based need for Care Coordination and Home Telehealth services
2. Whether CCHT services should be integrated into the existing infrastructure of care or if new programs should be implemented
3. Whether there are quality improvements, increased patient access and cost-savings/cost avoidance that provide the business case to sustain CCHT services long-term.

Performing Needs Assessment

Using available routine VHA data sources e.g. DSS, KLF etc, interrogate your local data to identify patient groups at high-risk of frequent hospital admissions/unscheduled clinic visits. These are the high-use, high-cost patients that provide the initial business case on which CCHT services should be based. By analyzing the diagnostic codes that are most commonly applied to these high-use, high cost patients it is possible to determine what diseases and conditions should be targeted in your initial CCHT implementation.. Experience in 5 VISNs has shown that common patient populations that benefit from CCHT in VHA include patients with the following diagnoses:

1. Hypertension
2. Diabetes
3. Heart failure
4. Coronary artery disease
5. COPD
6. Dementia
7. Pain management
8. Stroke
9. Arthritis
10. Depression
11. PTSD
12. Bipolar disorder
13. Palliative Care
14. Schizophrenia

Activity data on the high-use, high-cost patients that frequent your current VISN/medical center/satellite/CBOC sites that provide services will inform you where CCHT programs should be optimally located in terms of meeting identified health needs. These data will normally include numbers of hospitalizations, hospital bed days of care, ER visits, unscheduled clinic visits, nursing home admissions, nursing home bed days of care, and pharmacy prescriptions for the patients with the targeted diseases/conditions. It is important to emphasize at the outset that because routine patient data sources are linked to disease classifications this is a logical source of needs assessment data. This does not mean that the program that you establish will take the same disease-based approach. Although optimizing the monitoring, investigation, diagnosis and treatment of common diseases/conditions is a major component of CCHT the factors that make many of these patients high-use, high-cost are because of biopsycho-social issues and aspects of care that are amenable to prevention and self-help.

General Selection Criteria

To determine who may be appropriately referred for Care Coordination and Home Telehealth services, commonly used VHA criteria include:

1. Eligible veterans with established high-use, high-cost consumption patterns.
2. Homebound veterans with chronic health conditions
3. Patients “at risk” for long-term institutional care because of self-limiting conditions
4. High-risk populations such as HIV

General Exclusion Criteria

1. A home/residential environment that is unsafe for patient, staff or equipment
2. Documented violence/aggression
3. Active substance abuse
4. Patients who decline participation in the informed consent process
5. Patients without access to a telephone and electricity

Needs Assessment: Sample Forms (See Appendices)

When your CCHT program commences enrolment of patients the data from the patient assessments based on explicit inclusion/exclusion criteria form the basis for an ongoing needs assessment of the population it is managing. Appendix 1.A: OCC recommended CCHT Telehealth Needs Assessment Tool 1 is a basic review that can be supplemented by the second generic assessment tool that includes a caregiver assessment.

Appendix 1.A: **OCC Recommended CCHT Telehealth Needs Assessment Tool 1** is a basic review that can be supplemented by a second generic assessment tool that includes a caregiver assessment.

Appendix 1.B: **VHA’s Home Telehealth Needs Assessment Tool 2**

Section 2.	Enrollment Considerations

Having determined the patient populations for whom CCHT is suitable in your prospective program/s it is then necessary to consider the clinical aspects of services that must include all the required elements for provision of services, competency, and accreditation.

VHA Directive # 2002-042 ***The Credentialing and Privileging of VHA Health Care Providers Remotely Delivering Health Care to Patients at Home, In Vet Centers, and In Non-health Care Settings via Telemedicine and/or Telehealth.***

This directive is a comprehensive statement on the requirements for VHA provision of remote services through Home Telehealth. Its criteria for providing remote telehealth services to patients in their homes must be followed in addition to any other accreditation requirements (e.g., JCAHO). The directive is available on line at
http://www.va.gov/publ/direc/health/direct/12002042.pdf

Management of Services

Before initiating a CCHT program decisions about care management have to be made. The following questions must be addressed in advance of implementation:

1. Which patients will be managed (based on the needs assessment)
2. How will these patients be managed (e.g., what services will be provided? Will these services replace existing care, augment existing care, or provide services not currently provided?)
3. How often will services be provided (e.g., frequency of services)
4. Who will provide these services

For example the patient acuity and programmatic decisions involved in caring with patients with very severe cardiac failure, or post cardiac surgery using CCHT that require 24/7 access to immediate advice will differ from care aimed at a less acute population that will be supported by an 8am to 4pm program Monday to Friday that is supplemented after hours by a Telecare program. The answers to the above questions can be obtained in data obtained through the needs assessments, internal databases local reports and through interviews and focus groups with practitioners. In these interviews and focus groups it is important to focus on the needs of the patients you are intending to target in your program. These patients “fall through the cracks” in the system. The answer to their care is not more of the same but using innovative new technology to supplement existing care. The clinicians who are most likely to provide CCHT services include: nurses, social workers, dieticians, rehab therapists, pharmacists, and physicians. Once the questions of who will provide the services, where they will provide them and the acuity levels of patients have been answered then policies, procedures, informed consent, and protocols can be initiated. Remember that the patients that CCHT has proved most effective in caring for are those that are high-use, high cost because of hospital admissions/clinic visits that have been precipitated by biopsychosocial problems or are amenable to prevention strategies that mean diseases/conditions are self managed and corrected at an early stage of progression.

Care Coordination

The essence of Care Coordination as it is being implemented in VHA is that it involves the assessment and monitoring of patients in their residential environment and provides the appropriate information to providers and the healthcare system to assure the right care, at the right place, and at the right time. Care coordination reduces clinical complications and the use of resources that these complications can consume. CCHT is one aspect of Care Coordination and it increases patient satisfaction, improves outcomes, raises work efficiency and enhances management of chronic disease through collaboration between the CCHT and other service providers and healthcare team members using an interdisciplinary approach. It is important to note the relationship between CCHT and care management and case management. CCHT is not intended to replace current care management or case management activities. Rather, using home telehealth, disease management and health informatics technologies it is intended to enhance and extend current care management/case management activities. It is important that these technologies are applied in a safe, effective and cost effective manner and CCHT provides this framework. The interdisciplinary and standardized approach that has been taken by CCHT means that it can be applied across a variety of programs and patient circumstances. For example some VISNs have created a specific Care Coordination Service to support CCHT, others are implementing CCHT as part of Home-Based Primary Care (HBPC), Mental Health Intensive Case Management (MHICM) or through and Ambulatory Care, Cardiac or Diabetic Clinic. This cross cutting approach is reflected in how CCHT is coded and workload activity is captured as will be explained later.

Either through establishing a designated Care Coordination Service, or using existing services delivery structures (e.g. HBPC etc), your aim is to design the CCHT program and structure it by describing explicit policies, procedures and protocols. The appendices below give samples of these that you can use to tailor to the needs of the patients you will serve and the practitioners who will provide these services. You will see that these include technology aspects that relate to patient safety and clinical issues. The selection of technology is a vital consideration that will be considered below in Section 4.

As you develop policies and procedures please note that OCC is a program support office and is a resource to help in the standardization of CCHT for the benefit of veteran patients. OCC's role is not to mandate how services are provided. However, since the intention of CCHT is to promote the independent living of patients at home it is important that services are coordinated. Imagine a "snowbird" in Seattle. It would be no benefit to this veteran to have CCHT is he/she could not travel elsewhere. Therefore consider OCC as a resource to help in this vital component to implementing these innovative new services.

Policies and Procedures (see Appendices)

Appendix 2.A: **VHA's Home Telehealth Policy Template**

Protocols (see Appendices)

Appendix 2.B: **VHA's Home Telehealth Equipment Maintenance Policy**

Appendix 2.C: **VHA's Home Telehealth & Disease Management Protocol**

Appendix 2.D: **VHA's Home Telehealth Safety Considerations**

Informed Consent (see Appendices)
Appendix 2.E: **VHA's Home Telehealth Informed Consent/Fact Sheet**

Enrollment Process Flowchart (see Appendices)
Appendix 2.F: **VHA's Care Coordination Enrollment Process**

Screening Tool for Enrollment (see Appendices)
Appendix 2.G: **VHA's Care Coordination Screening Tool**

Section 3.	**Human Resources**

It is helpful to keep in mind that CCHT involves a range of processes that enable innovative new technologies to be used in the delivery of care management and case management. The people processes are the most complex considerations. The following examples are provided to help in these people processes by illustrating how Human Resource and accreditation requirements should be approached when implementing a CCHT. Credentialing and privileging of home telehealth service providers is addressed in the VHA Directive #2002-042. Sample orientation guidelines and functional statements/competencies are provided in attached Appendices listed below. For purposes of consistency, the term 'care coordination' and 'care coordinator' are used. This does not preclude use of the term 'case management', 'case manager', or other similar positions and terminology.

Performance-Based Interview (PBI) Tools for VISN Care Coordination Positions

Appendix 3.A: **PBI Tool for Lead Care Coordinator Position**

Appendix 3.B: **PBI Tool for Care Coordinator Position**

Employee Functional Statement/Competencies and Position Description

Appendix 3.C: **Care Coordinator Functional Statement/Competencies**

Appendix 3.D: **Program Assistant Competencies, Care Coordination Program**

Appendix 3.E: **Secretary Competencies, Care Coordination Program**

Appendix 3.F: **Care Coordinator, Title V Position Description**

Appendix 3.G: **Care Coordination Service (VISN Business Office) Clinical Manager Position Description**

Appendix 3.H: **Care Coordination Service (VISN Business Office) Director Business Operations Position Description**

Appendix 3.I **Standards of Ethical Conduct**

Employee Orientation Checklist

Appendix 3.J: **Care Coordinator Orientation Checklist**

Appendix 3.K: **Equipment Skills Checklist for Employees**

Credentialing and Privileging

VHA Directive # 2002-042 is available on-line at
http://www.va.gov/publ/direc/health/direct/12002042.pdf

Section 4.	Technology

Technical Requirements

After establishing the target population, the practitioners to be involved, and the clinical procedures and practices to support the CCHT program, it is then the correct stage to consider the exact technology to employ. VHA is establishing secure environments on the VA information technology for the acquisition, storage and transmission of patient data associated with CCHT. Off-the-shelf technologies that are accessible under a national contract can be placed in patient's homes and connect to servers within the VA firewall that are supported by the appropriate vendors for the purposes of downloading and upload data so that CCHT staff can monitor patient's conditions on an ongoing rather than an episodic basis. Currently CCHT access these data across the VA network from proprietary vendor system . OCC and the CIO's office in VACO are working on full integration between vendor systems that are available under national contracts. It is anticipated that by September 2004 bi-directional HL-7 messaging of patient data will be possible between CPRS and vendor systems so that VA staff can begin to view CCHT data that has been merged with patient data from other VA systems.

Secure gateways that include telecommunications protection devices, intrusion detection systems, and network firewalls will protect vendor systems. Telecommunications protection devices may include security sensors placed on the phone circuits to monitor incoming calls. The sensor will relay data to the Telecommunication Protection System that will provide for overall security management. This management will include fraud protection, utilization data, security policy oversight and policy enforcement.

Home Telehealth Equipment

Appropriate technology will be purchased by prospective CCHT programs through the national contract and includes in-home messaging and monitoring devices, telemonitors, and videophones. OCC recommends that whenever possible before products are finally selected, prospective CCHT programs arrange for vendor demonstrations and pilot test products that are candidates for selection in the target patient population before purchase to ensure appropriateness. **Technology should be selected to meet the needs of the target population instead of making the target population fit within the scope of services provided by the technology.** It is also recommended CCHT programs ask vendors for reference sites they can contact to obtain information from other customers and identifying the advantages as well as any problems or pitfalls with the technology under consideration.

Back-up for Equipment Failure (See Appendices)

A risk management strategy must be planned in advance of implementing the technology to ensure continuity of appropriate patient care in the event of equipment failure. This strategy should be formalized in policies and procedures that ensure adequate education and training of all participants in back-up arrangements e.g. IRM.. Customer support options provided by each vendor should also be included in the back-up procedure. The following Appendices cover the equipment policies and procedures. It is highly recommended that CCHT programs keep a log of

equipment failures and faults. These data will be used for contract monitoring purposes and to ensure that VHA purchases safe, effective and robust technologies for veteran care.

Appendix 4A: **VHA's Protocol for Disruption In Home Telehealth Service**

Appendix 4B: **VHA's Home Telehealth Technology Trouble-shooting Log**

Information Management and Security (See Appendices)
All technologies selected for providing Home Telehealth services must comply with the requirements of the Health Information Portability and Accountability Act (HIPAA).

Appendix 4.C: **VHA Directive 6210 Automated Information System (AIS) Security**. The following Appendices cover these issues. In case of doubt it is recommended that CCHT programs contact their local IT security Officer and the appropriate personnel in the CIO's office in VACO and involve OCC so information on such issues can be shared with other sites.

Appendix 4.D: **VHA Directive 0710 Personnel and National Information Security**

Appendix 4.E: **VHA Directive 6214 Information Technology Security Certification & Accreditation Program**

Technology Assignment Algorithm (see Appendices)
Appendix 4.F: **VHA's Home Telehealth Technology Assignment Algorithm**

Equipment Maintenance and Infection Control (see Appendix)
Home Telehealth equipment may or may not meet the JCAHO requirements for durable medical equipment (DME). If devices do meet requirements then the local medical center's policy for maintenance of such equipment should be followed. These procedures should be incorporated into the program policy or stand alone as a separate policy. Vendor guidelines for equipment maintenance should also be followed to comply with warranties or other requirements.

Home Telehealth equipment must be sanitized between patient use to ensure compliance with DME, JCAHO standards, and local medical center policy and procedures. These procedures should be incorporated into the program policy or stand alone as a separate policy.

It is recommended that program staff discuss equipment calibration and infection control standards with their local biomedical service. This service does provide regular scheduled calibration and quality control review for home telehealth equipment that meets the preventive maintenance and durable medical equipment (DME) standards. This process should be reflected in the program policy and procedure.

Appendix 4.G: **VHA's Home Telehealth Infection Control Policy**

Equipment Ordering Inventory Tracking Tools (see Appendices)
Prior to February 2004 ordering and tracking of CCHT equipment was undertaken at the individual facility or VISN level. Appendix 4. is a generic template used by such programs. From February 2004 it is anticipated that all CCHT equipment will be ordered and tracked in cooperation with your local prosthetics service under arrangements agreed between OCC and Prostehtics nationally. This does not mean that CCHT equipment can be ordered under the prosthetics budget only that for efficiency and cost effectiveness these functions are being handled by prosthetics as illustrated in Appendix 4.1.

Appendix 4.H: **VHA's Home Telehealth Equipment Tracking Tool Delivery Sheet**

Prosthetics Clinical Management Program (Draft)
Appendix 4.I: **VHA's Technology Ordering Process**

Section 5.	Coding, Workload Credit and Budget

Workload Credit
The importance of coding and workload credit was mentioned before. The importance of this cannot be stressed enough. For all practical purposes if it is not coded the clinical activity does not exist. DSS stop codes are attached to clinical activity for the purposes of recording numerical data on Care Coordination and Home Telehealth related visits. Each local facility currently will assign appropriate codes to document encounters with patients using Care Coordination and Home Telehealth. A national task force convened by OCC has completed a new national coding system that captures workload data that has been agreed by HIMS, DSS and the ARC. Guidance for setting up clinic stops is provided below.

Budget (See Appendix)
Appendix 5.A: **VHA's Home Telehealth Budget Template**

Coding/DSS (See Appendix)
Appendix 5.B: **VHA's DSS and Coding Guidelines**

Proposal Care Coordination/Home Telehealth (CCHT) Workload Credit Reporting Structures and Coding

Coding and Workload Capture

List of DSS Stop Codes for Care Coordination/Home Telehealth Workload Reporting

DSS Technical Conversion Guidelines

CCHT Clinic Stop Codes Diagram

Section 6.	Process of Care

The following appendices are examples of tools used with patients who will be enrolled in CCHT services. Each tool may need to be revised to fit the specifics of the particular equipment used in the home. Since Care Coordination and home telehealth services will be provided to patients with a variety of health care problems and diagnoses, patient education materials used locally should be appropriately provided to home telehealth patients.

Rights and Responsibilities (see Appendix)
Appendix 6.A: **VHA's Home Telehealth Patient Rights and Responsibilities**

Equipment Safety (see Appendix)
Appendix 6.B: **VHA's Home Telehealth Equipment Safety Considerations**

Skills validation Checklists (see Appendix)
Appendix 6.C: **VHA's Home Telehealth Patient Skill Validation Checklist**

Privacy and Confidentiality
Patient privacy in relation to audio-video visits will be maintained in accordance with VHA Directive # 2002-042 www.va.gov/publ/direc/health/direct/12002042.pdf and JCAHO standards http://www.jcaho.org.

Section 7.	JCAHO/Documentation Requirements

Applicable Standards
CCHT programs will have accreditation requirements found within the continuing care standards. This was recently confirmed by a visit of the care coordination leadership for VHA to the Joint Commission Headquarters in Chicago. A presentation and discussion cemented that programs would not be viewed as home care unless they were embedded in traditional home care models such as HBPC. A careful review of applicable standards is important before developing program policies and procedures.

Documentation Templates (See Appendix)
Appendix 7.A: **Network 1 Patient Education Template Note**

Initial Assessment (See Appendix)
Appendix 7.B: **Network 8 TLC Template Progress Note**

Televisit Note (See Appendices)
Appendix 7.C: **Network 1 Home Telehealth Progress Note**
Appendix 7.D: **Network 8 HH Initial Assessment and Note**

Monthly Note/ Quarterly Note (See Appendix)
Appendix 7.E: **T-Care Monthly Note**

Discharge Note (See Appendix)
Appendix 7.F: **T-Care Dis-Enrollment Progress Note**

Section 8.	Outcome Evaluation and Conditions of Participation

Data Collection Process

When designing an evaluation, one must select the 1) patient population of interest; 2) health care / telehealth service to be provided; and 3) appropriate measures. The patient population can be defined in two ways. First, the population can be defined by diagnosis, e.g., patients with diabetes or mental health problems. The second way is to define common problems experienced by the target population, e.g., medication management, over utilization of certain services. Section 1 of this toolkit describes the needs assessment process and patient selection criteria.

The health care or telehealth service to be provided can be defined along a continuum of care (e.g., from urgent/emergency care to routine to care delivered at home), by provider (e.g., MDs, ARNP, RN), allied health disciplines, by services offered (primary/ specialty care, consultation, monitoring, and / or educational), or by telemedicine communication mode or delivery (e.g., store & forward, Web based consultation and teaching, e-mail, phone, or interactive video).

The third axis represents the important outcome measures selected for the particular population and service delivered. Outcomes include utilization, patient and provider satisfaction, and clinical/functional/quality of life outcomes. These outcomes are described in this section.

The last component of this section includes an example of service line quality measures for performance improvement.

Available Databases for Patient Data

1. VSSC/ KLF
2. DSS
3. VISTA/PTF
4. CPRS

Patient Demographics

1. Age
2. Race
3. Marital status
4. Eligibility status
5. State/county [can be used to estimate travel distance, rural vs. urban]
6. Service [Era; combat]
7. Education level
8. Insurance coverage

Utilization Data (See Appendix)

The following should be considered when tracking utilization outcomes in the target population.

1. Number of hospital admissions
2. Number of hospital bed days of care
3. Number of ER visits
4. Number of unscheduled/walk-in clinic visits
5. Number of pharmacy prescriptions
6. Number of lab tests
7. Number of outpatient procedures
8. Number or frequency of phone calls to providers/case managers

Patient / Provider Satisfaction

Patient satisfaction

A few telehealth specific patient satisfaction surveys have been developed. Two examples are provided below. A third survey can be found in the following reference:

Demiris, G., Speedie, S., & Finkelstein, S. (2000). A questionnaire for the assessment of patients' impressions of the risks and benefits of home telecare. Journal of Telemedicine and Telecare, 6, 278-284.

Appendix 8.A: **Patient Satisfaction Example**

Appendix 8.B: **VA Patient Survey**

Provider satisfaction

Two examples of provider surveys are included below. Also included is an "item bank" – items can be selected to create a provider survey tailored to a specific project.

Appendix 8.C: **Provider Survey 1**, **Provider Survey 2**

Appendix 8.D: **Item Bank**

Clinical / Functional / Quality of Life Outcomes

Clinical outcomes will relate directly to the population receiving services. For example, if the population is defined by diagnosis, e.g., patients with diabetes or hypertension, then important clinical outcomes include stabilization of HgbA1c and/or blood pressure. If the population is defined by a health care problem, e.g., medication management, then the outcome measure relates to that problem. For example, medication compliance can be assessed using pill counts, pharmacy refills, laboratory testing, and patient self-report.

Functional outcomes can address physical, social, or cognitive/psychological function. Examples of physical function measures include the Katz Index of Activities of Daily Living (ADL) or Functional Independence Measure (FIM). Social function can be assessed using scales such as the Social Support Questionnaire. Cognitive/psychological function can be assessed using scales such as the Geriatric Depression Scale.

The most commonly used generic measure of quality of life is the SF-36 or SF-12. Veteran specific versions are recommended (e.g., SF-36V). Disease specific instruments are useful as well, for example the Minnesota Living with Heart Failure Questionnaire.

A full description of the functional status and quality of life tools listed above can be found in: McDowell, I. & Newell, C. (1996). Measuring health: a guide to rating scales and questionnaires, 2nd. ed. New York: Oxford University Press.

Performance Improvement / Quality Measures

Below is an example of service line quality measures for performance improvement. Within the list are appropriate measures addressing compliance with VA Clinical Guidelines.

Appendix 8.E: **Example Service Performance Measures**

Conditions of Participation (COP)

The VHA Office of Care Coordination (OCC) has established a process for designating CCHT programs that have demonstrated adherence to the programs Conditions of Participation—tried and tested clinical, business, and technical processes that are essential to the safe and effective implementation of a program. Site visits, as described in the COP Manual, will be scheduled in advance to give teams adequate time to develop program processes and prepare.

COP Manual (see Appendices)

Appendix 8.F: **VHA Conditions of Participation: Care Coordination/ Home Telehealth Programs**

Self Assessment for Program Recognition

COP Recognition Process

VISN 19 CCHT Examples

VISN 5 Coding Examples

VISN 12 Coding Examples

Section 9.	Marketing

Marketing the Home Telehealth program should begin during the planning phase and should include internal and external stakeholders. Sharing of information early on will also encourage buy-in from healthcare providers and other clinicians whose collaboration will be vital to the success of the program. Educational programs, technology fairs, luncheons or related events can be used to spread the word and build a base of support for the program. Press releases to the local media-newspapers, TV and radio stations should also be considered working through the local public affairs officer.

Marketing materials (see Appendices)
Appendix 9A: **Virtual Learning Center for Home Telehealth**

Appendix 9B: **Lesson of the Month Home Telehealth**

Appendix 9C: **Generic Telehealth Fact Sheet**

Appendix 9D: **Sample Press Release**

Section 10.	**Resources**

Glossary of terms: This is a partial listing of the most commonly used words or phrases to describe Home Telehealth activities, equipment or requirements.

Analog – Information electronic or otherwise that is created and transmitted as a continuous stream. Compare this to digital information generated by computers. Most Home Telehealth devices require the use of analog (direct dial, not through the PBX) not digital phone lines to operate.

Bandwidth – The capacity of an electronic transmission to transmit data per unit of time. The higher the bandwidth, the more data can be transmitted. Typically measured in kilobits or megabits per second (Mbps). Standard telephones are low bandwidth devices with cable TV being high bandwidth.

Baud rate – Is the ring rate or line power of the telephone line providing service into a given structure (home). Most Home Telehealth devices require a minimum baud rate of 14,000 to make successful video capture. However, the lower the Baud rate the likely disconnections will happen.

Component video – This type of video yields better image quality, higher lines of resolution, and better color.

Digital – Information coded in numerical values (bits). Digital data streams are less susceptible to interference like analog streams are. They can be more easily integrated with other data streams such as voice/video/data.

Digital camera – Captures images (still or motion) digitally and does not require analog to digital conversion before the image can be transmitted or stored in a computer. Most Home Telehealth equipment uses digital video cameras.

Encryption – A mathematical transposition of a file or data stream so that it cannot be deciphered at the receiving end without the proper key. Encryption is a security feature that assures only the appropriate parties participates in a video visit or data transfer.

Firewall – A computer connected both to the Internet and the local hospital network that prevents the passing of Internet traffic to the internal hospital network. Provides an added security layer.

Frame rate – Frames per second (fps) displayed on a video unit. A frame rate of 25-30 is considered full motion. Anything less than that is noticeably "jerky." Slower frame rates may be inadequate for some assessments such as gait and balance activities.

HL7 – Health Level 7. A standard interface between hospital information systems.

Internet – A loose gathering of thousands of computer networks forming an enormous worldwide area network.

Intranet – A "private Internet", or internal web that employs certain communication protocols used over the Internet. The Intranet may be linked to the public Internet through tightly managed gateways.

ISDN – Integrated Services Digital Network, a low-to-medium speed technology for digital telephone. Some Home Telehealth is ISDN based and can be used where available.
Local Area Network (LAN) – A computer network linking computers, printers, servers, and other equipment within a system. Can support audio, video, and data exchange.

Modem – Modulator/Demodulator. Enables transmission of digital data over standard analog phone lines and cable video systems.

Network – An assortment of electronic devices (computers, printers, scanners etc,) connected by wires or wireless for mutual exchange of digital information.

PBX – Private Branch Exchange (a.k.a. the switchboard) is a telephone system (i.e., switchboard, telephone lines, switching computer) within a VHA facility/campus that switches internal phone lines between VHA users, who actually share a certain number of external (outside) phone lines. Having a PBX saves money by reducing the number of lines required to connect all VHA facility telephones to the telephone company's central office.

Peripheral devices – Attachments to videoconferencing systems to augment their communications or medical capabilities. Examples include electronic stethoscopes, blood pressure cuffs, glucometers, and weight scales.

Pixel – A picture cell with specific color or brightness. The more pixels an image has, the more detail or resolution it can display.

POTS – Plain Old telephone System. The analog, public-switched telephone network in common use throughout the world. Most Home Telehealth products rely on POTS.

Real time – Sends and receives audio/video/data simultaneously, without more than a fraction of a second delay.

Resolution – The level of detail that can be captured or displayed. For video displays resolution is measured in pixels X lines X bit depth.

Store-and-forward – captured audio clips, video clips, still images, or data that are transmitted or received at a later time (sometimes no more than a minute).

Telehealth – The electronic provision of health care and information services for the direct benefit of patients and their families.

Thumbnails – Miniature pictures of images using very small, low-resolution data files. These download for display very quickly.

Transmission rate – Amount of information/unit of time that a technology such as POTS or digital ISDN phone line, satellite or wireless technology, or local area network can transmit.

Wide area network (WAN) – Wider in geographic scope than a LAN. Provides digital communications (voice/video/data) over switched or un-switched networks.

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American Telemedicine Association, *'Proposed Home Telehealth Satisfaction Item Bank'*, June, 2002 www.americantelemed.org/news/newres.htm

Contacts

Websites for telehealth organizations and publications have been provided as well as VHA contacts to help answer any questions that might arise in the process of planning for and implementing a Home Telehealth program. Please take advantage of these expert sources.

Websites:

Federal Telemedicine Update
www.federaltelemedicine.com
VHA Office of Care Coordination
http://vaww.va.gov/occ/
Telemedicine Center
www.telemed.org
Telemedicine Research Center
www.trc.telemed.org
Telemedicine Information Exchange
http://tie.telemed.org

Journals:

Journal of Telemedicine and Telecare
www.qub.ac.uk/telemed
Telemedicine Journal and e-Health
www.liebertpub.com
Technology and Health care
Technology in Practice
Technology in Society

Organizations:

American Telemedicine Association
www.americantelemed.org
American Telemedicine Service Providers

www.atsp.org

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